



## The calcareous nannoplankton response to climate change during the Maastrichtian

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Oxygen and carbon stable isotope studies of numerous DSDP and ODP Holes showed that significant climatic fluctuations occurred in the Maastrichtian. Several biotic events were recorded during this stage such as the extinction of Inoceramids and Rudists and significant variations in the diversity of planktic foraminifera. As far as the calcareous nannoplankton is concerned, no important changes were ever recorded for this group during this stage.

The analysis of Maastrichtian nannofossil assemblages on several sites from different paleolatitudes and oceanic basins (Tethys, Elles outcrop, Tunisia ; Atlantic, ODP Hole 1258A and DSDP Hole 525A ; Indian Ocean, ODP Hole 762C and Tropical Pacific, DSDP Hole 577A) reveal a common response of calcareous nannoplankton to global climate change.

From magnetochrons C32n to C30n, two episodes of cooling are underscored by the increase of cool-water taxa such as *A. octoradiata*, *G. segmentatum*, *N. frequens* and *K. magnificus*.

In the Atlantic Ocean, this climatic evolution is similar to that evidenced by the variations of  $\delta^{18}\text{O}$  on foraminifera. In the Indian Ocean, the response to these climatic variations is mainly recorded through the abundance of fertility taxa *B. constans*, *D. rotatorius* and *Zeughrabdotus* spp.

In the Uppermost Maastrichtian, all the studied sites show (1) a drop in abundance of cool-water taxa in the upper part of chron C30n (2) a drop of fertility taxa *Zeughrabdotus* spp. and/or *Discorhabdus* spp. and the disappearance of high-fertility taxon *B. constans* close to the C30n/C29r boundary, (3) an acme zone of tropical taxon *M.*

*murus* in chron C29r.

These events mark the end-Maastrichtian greenhouse warming linked to major Deccan volcanic degassing (Barrera & Savin, 1999).

The paleoecological evolution of calcareous nannofossils during the Maastrichtian confirms that the Uppermost Cretaceous was characterized by a great climatic and environmental instability. These results shall be considered for a better understanding of their mass-extinction at the K-T boundary and subsequent recovery.